Claims

[c1] 1. An apparatus for locking the wavelength or frequency of a light beam produced by a light source, comprising:

a first beam splitter to receive the light beam and separate out a portion therefrom as a sample beam;

a confocal etalon to receive said sample beam and filter said sample beam into a filterization beam;

a filterization photodetector to receive said filterization beam and produce a filterization signal based thereon that is representative of light intensity in said filterization beam and thus also of light frequency in said filterization beam, in said sample beam, and in the light beam; and

a link to communicate said filterization signal to the light source as a control signal to lock the wavelength or the frequency of the light beam.

[c2] 2. The apparatus of claim 1, wherein said confocal etalon includes two plates having opposed, semi-reflective surfaces that are two dimensionally spherical or parabolic, thereby being cylindrical instances of said semi-reflective surfaces.

[c3] 3. The apparatus of claim 1, wherein said confocal etalon includes two plates having opposed, semi-reflective surfaces that are three dimensionally spherical or parabolic, thereby being concave instances of said semi-reflective surfaces.

[c4] 4. The apparatus of claim 1, wherein said link is a control link, and the apparatus further comprising:

a signal link to communicate said filterization signal to a processor; and

said processor, to process said filterization signal into said control signal before communication to the light source via said control link.

[c5] 5. The apparatus of claim 1, wherein said link is a control link, and the apparatus further comprising:

a second beam splitter to also receive said sample beam and separate out a portion therefrom as a normalization beam;

a normalization photodetector to receive said normalization beam and produce a normalization signal based thereon that is representative of light intensity in said normalization beam;

a filterization link to communicate said filterization signal to a processor;

a normalization link to communicate said normalization signal to said processor; and

said processor, to process said filterization signal, with normalization based on said normalization signal, into said control signal before communication to the light source via said control link.

[c6] 6. A method of locking the wavelength or frequency of a light beam produced by a light source, comprising:

separating out a sample beam from the light beam;

filtering said sample beam through a confocal etalon into a filterization beam;

detecting light intensity in said filterization beam;

producing a filterization signal based on said light intensity in said filterization beam, wherein said filterization signal is representative of light frequency in said filterization beam and thus also the light beam; and

communicating said filterization signal as a control signal to the light source, to lock the wavelength or the frequency of the light beam.

[c7] 7. The method of claim 6, further comprising:

separating our a normalization beam from said sample beam;

detecting light intensity in said normalization beam;

producing a normalization signal based on said light intensity in said normalization beam; and

communicating said filterization signal and said normalization signal as said control signal to the light source, to lock the wavelength or the frequency of the light beam.

[c8] 8. The method of claim 6, further comprising processing said filterization signal into said control signal such that said control signal is suitable for directing the light source to change the wavelength or frequency of the light beam being produced.

[c9] 9. The method of claim 8, further comprising:

separating our a normalization beam from said sample beam;
detecting light intensity in said normalization beam;
producing a normalization signal based on said light intensity in said normalization beam; and
processing said filterization signal into said control signal based on said normalization signal.

[c10] 10. The method of claim 6, wherein said confocal etalon includes two plates having opposed, semi-reflective surfaces that are two dimensionally spherical or parabolic, thereby being cylindrical instances of said semi-reflective surfaces.

[c11] 11. The method of claim 6, wherein said confocal etalon includes two plates having opposed, semi-reflective surfaces that are three dimensionally spherical or parabolic, thereby being concave instances of said semi-reflective surfaces.

[c12] 12. An improved apparatus for locking the wavelength or frequency of a light beam produced by a light source, of the type in which an air-spaced etalon filters a sample beam that has been separated out from the light beam, the improvement comprising said air-spaced etalon being a confocal etalon.

[c13] 13. The improved apparatus of claim 12, wherein said confocal etalon includes two plates having opposed, semi-reflective surfaces that are two dimensionally spherical or parabolic, thereby being cylindrical instances of said semi-reflective surfaces.

[c14] 14. The improved apparatus of claim 12, wherein said confocal etalon includes two plates having opposed, semi-reflective surfaces that are three dimensionally spherical or parabolic, thereby being concave instances of said semi-reflective surfaces.